FAA AVIATION NEWS

OCTOBER 1972

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MINI COVER:
Lower Away! Ditched pilot is plucked from the sea and transferred to Coast Guard boat. Page 8.

FAA AVIATION NEWS

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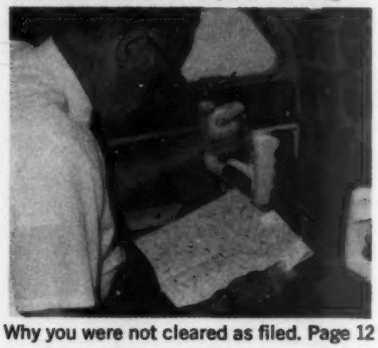

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Audible Warning

A small investment in time and money that could prevent hearing loss

The general aviation pilot who flies on the average more than three hours a week is likely to find himself slightly deaf after several years of flying, unless he uses properly fitted earplugs while in the air.

This advisory notice by the Federal Air Surgeon, Dr. Peter V. Siegel, is a reiteration of a warning given four years ago, following publication of studies on cockpit noise intensity carried out by FAA's Civil Aeromedical Institute in Oklahoma City. The study clearly established the fact that wearing properly fitting earplugs is a necessary safety precaution, especially in single-engine/fixed wing and rotary-wing aircraft. It is not only a health measure, but an aid to more effective handling of the airplane.

The common use of closed cockpits in modern aircraft offers the pilot obvious advantages of protection from noise, dirt, weather, etc., in comparison with the open cockpit environment of earlier airplanes. The deafening effects of years of flying in open-seater, powerfully-engined airplanes is well known. But there is an erroneous belief among many pilots that the modern cockpit gives you complete insulation from the harmful effects of engine noise.

The notion was disproven by the FAA investigation of 1968, which was conducted during inflight conditions using 15 of the most popular single-engine aircraft and 11 of the most popular light twins. A sensitive recording device was taken aloft in each of the airplanes and a microphone was held at the height and location in the cockpit where the pilot's head would be positioned. Recordings were made at three different altitudes for each aircraft—at 2,000, 6,000, and at 10,000 feet, MSL—with vents open and vents closed. Later in the laboratory the recordings were analyzed and the data was plotted against damage-risk criterion (DRC) curves to determine the length of flying time, required under varying conditions, to produce hearing loss.

Results were surprisingly similar in both single-engine and twin-engine aircraft. The tests showed that without earplugs, as little as two hours a day in the aircraft tested could cause some hearing damage, especially at the lower altitudes (2,000 feet). Keeping the air vents open increased susceptibility to some slight extent, but this was negligible when the exposure time exceeded two hours. The conclusion was that engine noise in the cockpit of any light aircraft may cause irreversible hearing loss when a person is exposed to it more than three or four hours a week for a few years.

Investigators also concluded that engine noise could contribute to pilot fatigue, as well as interfere with cockpit conversation and radio communication. During the critical takeoff phase of flight, when the engine is operating at full power, the ability of a pilot to receive emergency radio transmissions from the control tower can be dangerously poor in many light aircraft, unless his ears are protected.

However, it has been shown that the proper use of earplugs can afford the pilot complete protection against all of these hazards, without impeding his ability to communicate over the radio or inside the airplane.

The report emphasized that merely stuffing the ears with absorbent cotton will not protect them satisfactorily. Earplugs designed for aviators are on the market and are usually available from fixed base operators. Pilots using them for the first time are advised to pay careful attention to the directions for inserting them. Simply jamming them in could damage the ear; if they are not seated properly they may not provide complete protection.

As a matter of fact, some pilots have difficulty being fitted with standard earplugs, and have them custom made in order to be able to fly long hours in comfort and safety. There are also earplugs available made of soft, compressible material that reshapes itself to the configuration of the ear canal. Earplugs need not be uncomfortable, but they *must be snug*, and they may take some getting used to. If you find that you are not aware of their presence when you first insert them, they are probably too small, or not properly seated. One way of testing is to press on them gently with your finger, one ear at a time, noting whether the noise level around you drops. If so, they are not doing you much good—some adjustment is necessary.

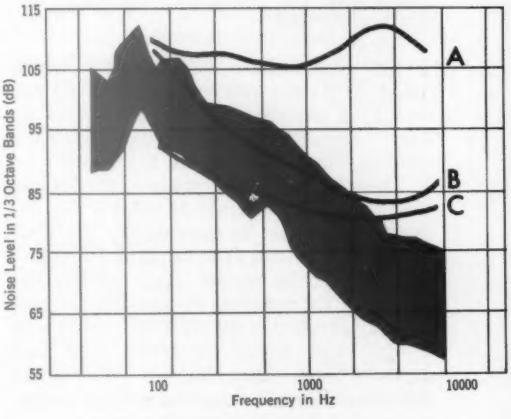
A radio head-set, even when it covers both ears, is not adequate protection against engine noise. It will lessen the noise that you hear, but it will not filter out all of the low-frequency sounds which are the most damaging to the ears. Earplugs should be worn under the head-set.

If the findings of FAA's medical investigators do not convince you, the Federal Air Surgeon suggests a simple demonstration you can carry out yourself. Wear one regulation earplug on your next flight in a light aircraft. After you land and shut down the engine, remove the plug. You will discover a dramatic difference in your hearing sensitivity: the ear that was not plugged will seem almost deaf, in comparison with the other, and in fact it may be an hour or more before full sensitivity is restored—fair warning!

For less than a dollar a pair, you can buy insurance against insidious loss of a valuable sense of perception. Why risk it?

The published study. "Cockpit Noise Intensity: Fifteen Single-Engine Light Aircraft" by Jerry V. Tobias, September 1968 (AM 68-21), may be purchased from the Clearinghouse for Federal Scientific and Technical Information, U.S. Dept. of Commerce, Springfield, Va. 22151. The companion study (AM 68-25) is entitled "Cockpit Noise Intensity: Eleven Twin-Engine Light Aircraft." Price is $3.00 each.

Damage risk criteria. Black lines represent the exposure to noise at all frequencies by a pilot during an eight hour flight at 6,000 feet, wearing earplugs (A), and unprotected (C). Line B represents the exposure during a two hour flight without earplugs. Hearing damage may take place whenever the noise level range (colored area) exceeds the black lines. (Original chart has been simplified in part.)



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You can't believe it's all gone, your airplane. But there is the empty tie-down space, unmistakably yours by number, and you know you tied down there last night, next to the familiar *Air Commander*. You gave no orders for gassing or maintenance, but you check the hangar and the line boys anyway, and finally you walk along the flight line and check every red and white single-engine aircraft on the field.

Gone.

You can't believe they took the whole thing. You dash over to the tower and ask when the airplane took off. *They have no idea? Impossible!* They must have noted the number when it was cleared for takeoff.

The tower supervisor politely reminds you that they do not operate 24 hours a day. To your request that he immediately query all towers within flying distance about your missing airplane, he replies, again politely but firmly, in the negative. He explains that the primary function of the air traffic service is to control and advise air traffic, and that thievery is a matter for law enforcement officials. FAA will cooperate with the police, but the latter are responsible for the recovery of all stolen property, including aircraft.

It may sound like a cop-out, but it is not. If anyone steals your airplane he is not likely to fly it to a controlled airport, or to utilize air traffic control services. Indeed, one of the hazards to flying of aircraft thievery is the clandestine, and illegal, use of the airspace in such a manner as to endanger other traffic. Another danger is that the aircraft may be abused—flown at excessive speeds that damage the engine, for example, or weaken structural members. The wrong type of fuel or oil may be used, or the gear bounced hard in a night landing on an unpaved strip. More noticeably, avionics equipment may be removed.

Aircraft theft is unfortunately on the increase, stimulated perhaps by the notoriety given to skyjacking. Like automobiles, aircraft are being stolen in conjunction with various crimes, including illicit drug traffic and smuggling. They are sometimes re-sold after identification marks have been altered. More often they are cannibalized for valuable parts and equipment, especially avionics, which are sold either in a black market or to innocent purchasers.

The increasing dependence upon avionics, especially transponders, in today's airspace, has made the airplane a target for criminals —a fact of life which many persons long accustomed to a trusting camaraderie among flyers have difficulty accepting. The day when pilots were few in numbers and generally known to one another is long gone—there are more than 700,000 currently active pilots in this country, and over 130,000 flyable general aviation airplanes.

Because of their lightweight construction aircraft are generally easier to break into than other vehicles. Once airborne, they are not restricted to well defined roads or susceptible to roadblocks for identification. They can usually be landed in open country away from airports, and they can cover great distances in a short time, in the dark and without illumination. They have no standard license plates, and their registration numbers can be painted over with new ones.

All of these reasons explain why stolen aircraft are not easily or quickly recovered.

Tracing the occasional airplane taken by a prankster is no problem: such planes are usually recovered quickly, although not always in the best condition. Aircraft taken by *professionals* often disappear permanently, causing their owners no end of anguish, trouble and expense.

To prevent this from happening to you, FAA's Office of Air Transportation Security urges all pilots to assume an individual responsibility in safeguarding aircraft. One of the best safeguards is a well-fenced, lighted and patrolled (24 hours) airport. Lock the aircraft when leaving it—this will not keep all thieves out, but it will discourage some. There are also audio warning devices that may be helpful, especially if there is no overnight surveillance at the airport.

At many airports pilots are in the habit of leaving a set of keys with the manager. This is fine, as long as the keys are not simply hung on a hook within reach of any passerby. If you are sharing the use of an aircraft with others, it is safer to have individual keys made, than to depend on a common repository.

Be cautious, when selling your airplane, about the prospect who has contacted you only via the telephone and who wants to try the plane out at some odd hour when you cannot be on hand. Insist on meeting the individual first and seeing identification, including pilot's license and medical certificate. If you cannot be there yourself, it is worth while paying the fixed base operator for his time in representing you and looking after your interests.

If in spite of all precautions you do lose an airplane to an unknown party, your first step is to contact the local police—or the FBI, if you have reason to believe that the airplane was taken across a state line. The theft will then be entered in the FBI's National Crime Information Center (NCIC) computer system, and all pertinent data will become available to law enforcement officers throughout the country. Any subsequent inquiry of the Center, using only the registration ("N") number, will inform the requester that the aircraft has been stolen and will name the agency conducting the investigation.

In reporting an aircraft theft you should supply the following information: Aircraft make and type, including year of manufacture (1967 Piper 140). FAA registration and serial number. Date and place of theft. Registered owner and address. Your name and address, if other.

The standard practice is for the local police to notify the nearest FAA flight service station or FAA Air Transportation Security office and request that an aircraft "lookout" be instituted. If you call the FSS first, they will refer you to the police. Prompt action is important: the first 48 hours following the theft are critical as far as the chance of recovery is concerned.

If you are planning an extended vacation without your airplane, or will be away from the airport for a long period on business, it is a good idea to let the fixed base operator know that the plane is not to be used during this time—and where he can reach you if it disappears.

FAA maintains a current "wanted list" of missing aircraft at Washington headquarters and provides their identity to appropriate field offices. This alert system has resulted in the recovery of some aircraft, and to the apprehension of thieves by police and the FBI. However, it would be naive to assume that every movement of every aircraft is noted by the FAA, or that your parked aircraft is under constant Federal surveillance. The main burden for keeping your aircraft and its parts safe from criminal thieving hands is on your shoulders. You can contribute importantly to the suppression of crime on the airport by seeking adequate security for your airplane at all times.

The unscrupulous always seem able to find a black market to dispose of stolen items. Never buy equipment from an unknown person unless you are positive of its origin. Even with a bill of sale, part could be on a "hot list."

You can contribute to flying safety by making sure that no one can go joy-riding in your plane without your permission. Resist the entreaty of friends that you leave the keys under the seat, or under a tire, or in some other supposedly crafty hiding place. Too many lives have been lost by youths who, with no proper training, took an aircraft up for a lark, or to prove something. Seekers can be just as crafty as hiders.

You can also help by being very cautious about buying any aircraft part from unidentified sources. The money you save could be coming out of your other pocket.

Gone are the days when a pilot could leave the keys in an unattended airplane and be sure it would still be there whenever he returned from the line shack. Today, aircraft owners must observe the same caution that applies to automobile owners: "Lock it up and take the key."

FAA Alert List

The aircraft listed below have been reported missing or stolen. If you notice any of them, report the information to the nearest FSS or police office. Bear in mind that the aircraft may have been returned to its rightful owner by the time it comes to your attention.

American AAIA	N9280L
Cessna 150	N4844X
Cessna 150	N8589J
Cessna 172	N2412U
Cessna 172	N4301Q
Cessna 172	N79526
Cessna 182	N3127Q
Cessna 182	N5706B
Cessna 210	N3884Y
Cessna 337	N5439S
Piper PA-17	N4612H
Piper Cherokee	N6505J
Mooney 21	N9247M
Beech 18	N636CF

Talking Transponders

A Little DAB Will Do It

DABS sounds like a new detergent, a deodorant or something you put on your hair for that natural look. It is none of these things. Rather it is an important FAA research and development project expected to bring about major improvements in the nation's air traffic control system.

DABS is an acronym for Discrete Address Beacon System, a term which is not exactly self-explanatory to the layman. The word "discrete" is frequently confused with "discreet", which has an entirely different meaning. Discrete means *seperate, distinct* or *specific. Beacon* is the radar interrogator which elicits replies from all transponder-equipped aircraft. A Discrete Address Beacon System is one capable of *interrogating,* and getting a *reply* from, a *specific airplane* rather than all the airplanes within the beacon's zone of coverage, as is the case with today's equipment.

FAA's air traffic control system is in process of transition to what is known as the Third Generation, a semi-automatic system which represents a substantial improvement over earlier capability. The major efficiency gain stems from the use of computers and automatically-fed displays to reduce the workload of the individual controller and increase his overall effectiveness. With regard to the control and separation of aircraft, the principal input to the computers and displays comes from the Air Traffic Control Radar Beacon System (ATCRBS) which ATC people call "at-crabs".

ATCRBS is a surveillance system consisting of a network of beacon interrogators colocated with radars in terminal areas and in enroute control center areas. The rotating antenna of the radar picks up airplane targets within the zone of coverage and provides information as to the target's direction and distance from the ground station. If the target airplane has a transponder, the ground-based (beacon) interrogator can elicit additional information as to identity and altitude. The surveillance data is checked automatically against flight plans pre-stored in the computers.

The interrogation process works this way: the transponder is a combination receiver/transmitter capable of replying automatically to a signal from the ground requesting identity and altitude. The identity is a set of numbers cranked into the "black box" by the pilot (ATC identification is assigned at the start of a flight, sometimes changed during the flight). Altitude information is supplied directly to the transponder by a special encoding altimeter in the airplane.

The interrogator on the ground sends time-spaced pairs of pulses to the airplane's transponder, which recognizes the nature of the query by virtue of the spacing between pulses. A pair of interrogation pulses separated by eight microseconds is know as Mode A; it is a request for identification. Mode C, in which the pulses are spaced 21 microseconds apart, asks for altitude. The transponder replies by sending its own series of pulses, called a "train." An automatic decoder at the ground station examines the train, translates it into identity or altitude and forwards the information to the appropriate controller's display or radar acope.

ATCRBS serves as the main data acquisition source for today's ATC automation systems. However, it does have inherent limitations as to target capacity, resolution and ranging accuracy.

The beacon system also suffers from electronic self-interference. All interrogators operate on the same frequency (1030 MHz) and all transponders reply on a common frequency (1090 MHz). As a result, *all* transponders in a given reception area (which may be hundreds of miles in diameter) reply to *all* interrogations picked up by their receivers. Engineers sometimes use this analogy: it is like using a bullhorn to ask the identity of a specific person in a large group by shouting "Who are you?" or "Where are you?"—and getting replies from everyone within hearing. In a high-density terminal area, there may be as many as 60 radar interrogators, each querying a specific airplane but getting answers from every transponder within line of sight. The result is a high level interference, both at the transponders and at the interrogator receivers on the ground, causing lost or garbled replies.

DABS Emerges

In 1968, the Department of Transportation formed the Air Traffic Control Advisory Committee to study and recommend developments for the type of system needed in the 1980's and beyond. The aim was to increase overall system capacity, particularly in terminal areas; to improve safety despite growing traffic volume; and to increase the traffic handling capability of controllers.

Their general conclusion was that the Air Traffic Service would eventually need a new surveillance system better adapted to advances in automation. Specifically, there was a need for discretely-addressable airborne transponders for improved quality and reliability of surveillance data. Additionally, there should be a means of incorporating a digital data-link for the transfer of data communications and control information between the aircraft and the ground. From these recommendations emerged the Discrete Address Beacon System (DABS).

DABS is essentially a considerably advanced ATCRBS. The basic principle is the same—a network of radars and interrogators which measure range and azimuth of targets and obtain target identity and altitude from coded replies. The primary difference—and a very important one—is that the airborne transponder will be programmed to *recognize its own specially-assigned (discrete) call number.* It will reply only when the querying pulses contain that special signal, ignoring the interrogations beamed to other aircraft. Its reply train will include a "signature," so that controllers will know that the proper transponder has responded.

Being developed as part of the ATCRBS improvement program is a new type of antenna called Electronic Scan or E-Scan. Instead of a single rotating antenna array, E-Scan is a stationary circular array of a large number of columns of dipole antennas, that, by means of electronic phasing and switching can form a beam pointing in any given direction. For updating azimuth information, E-Scan could eliminate the need for waiting until the rotating antenna (now in use) completes a sweep. From computer-stored information that provided the last known azimuth of any tracked airplane, the E-Scan

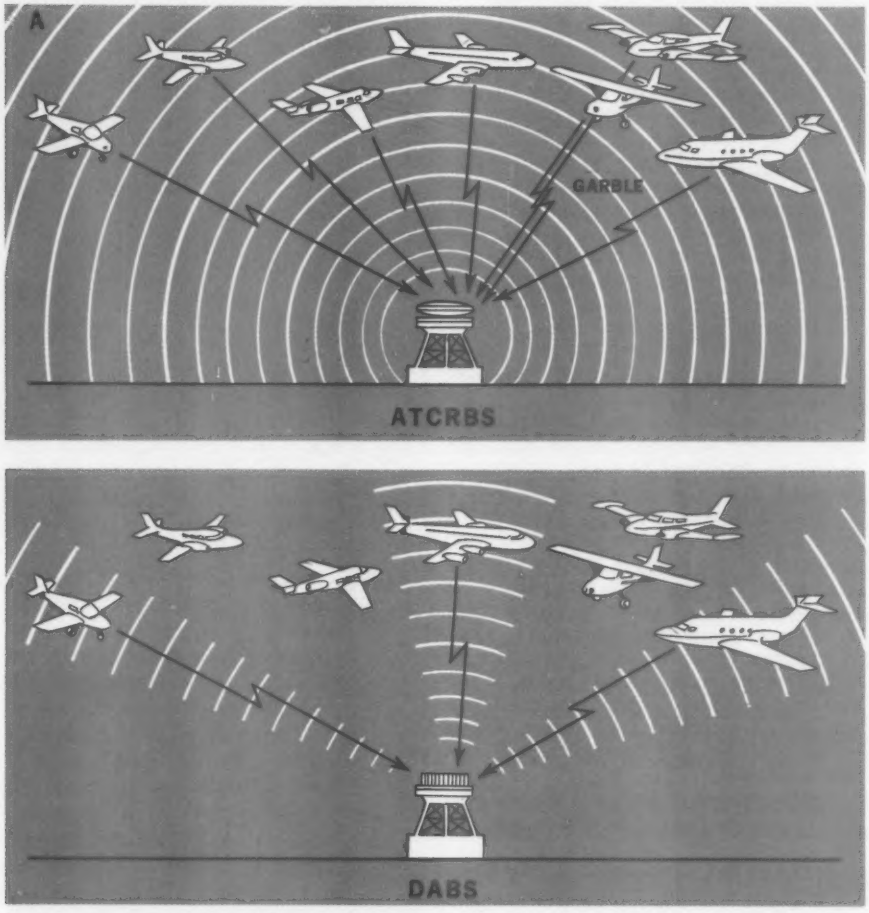
array could be properly pointed toward the area of an aircraft target for instant updating. This feature makes the E-Scan antenna particularly suited to possible application to the DABS system.

The E-Scan will have an additional important capability: to direct the antenna beam in such a fashion that it will "hop over" ground-environment obstructions that would otherwise cause unwanted reflections. E-Scan will necessarily be expensive hardware and initially, at least, all radar sites may not have the electronic scanned antenna. Therefore, DABS must also be capable of operating with the conventional mechanically-rotated antenna, although the antenna will be of a more advanced type than those now in service.

Since DABS addresses individual aircraft —rather than everyone in line of sight, as in the "bullhorn" approach—it offers an additional advantage in that it can be used for data communications and control purposes as well as surveillance, by means of the data link to be incorporated in the system. The data link capability means that the DABS signal transmission will have data communications capacity beyond that required for identity/altitude queries. This data communication capacity will be adequate for most simple control instruction that would permit quicker corrective action than would voice transmission. In this sense, DABS offers a new dimension of utility as a ground-based collision-avoidance aid to a concept known as Intermittent Positive Control (IPC).

IPC was another of the recommendations of the Air Traffic Control Advisory Committee, which urged its development and application in mixed VFR-IFR airspace. IPC is a concept of a computerized system for predicting flight path conflicts and for issuing corrective commands to normally uncontrolled aircraft when it appears necessary to avoid a potentially hazardous mid-air situation. A computer, fed by the surveillance system specific data on altitude and flight paths of all aircraft in its zone, would make an early determination that two aircraft were on conflicting courses. Using the DABS datalink, the IPC computer would automatically send a signal to the pilot of one of the aircraft—"Climb," for example, or later, when the conflict has been resolved, "Stop Climb," The computer would also send this information to the human controller.

Thus, DABS and its associated E-Scan antenna promise solution of a number of existing problems and at the same time offer new dimensions of air traffic control. With new systems like these, coupled with continually advancing increases in the general level of control automation, the FAA hopes to extend the useful life of the Third Generation System into the 1990's.



In the currently used air traffic control radar beacon system (diagram A) all transponders reply continuously to sweep of the interrogating antenna, resulting in occasional distortion of signal from aircraft on the same or adjacent azimuth bearing. The "speak-when-you-are-spoken-to" principle of DABS (bottom) would suppress replies from all except desired targets.

How Much and How Soon?

To the user of the system the questions of primary interest are these: When DABS arrives will I need a new transponder? If so, will it cost more? When will it be required?

Yes, it will be necessary to re-equip; existing transponders will not be able to respond properly to DABS. Since there will be a long period of transition, the first generation of new transponders will have to be capable of working with either DABS or ATCRBS.

As to cost, it can be stated generally that a more sophisticated transponder is very likely to cost more. At this stage, however, no one can say how much more.

The *When?* is best answered by a brief outline of progam status and schedule. FAA began working on the general DABS concept in 1970, and in 1971 produced a technical development plan, which is a broad view of "how to get there." The formal development program was begun in January 1972 with the award of a contract to Lincoln Laboratory, Lexington, Mass. for systems definition, which is how to get there in detail, including specifications for prototype hardware. This first phase will last through 1973.

Early in 1974 the program will move into Phase II, in which an industrial contractor —or team of contractors—will produce the first DABS prototype. The system will undergo about a year of testing and evaluation at FAA's National Aviation Facilities Experimental Center, Atlantic City, N.J. to assure the validity of the design and its compatibility with other ATC systems. After that, probably in mid-1976, comes Phase III, a lengthy series of operational trials, or field tests with "live" air traffic. Assuming successful completion of all phases, DABS will be introduced to regular service about two years after the start of Phase III. Introduction of a major new system is not an overnight process, however, so while DABS is gradually being installed at facilities ATCRBS will continue to operate.

So, the plane-owner who wants to be among the first DABS users should figure on 1978. Those who are in no hurry to re-equip should be able to use their current transponders well into the 1980's. ■

No matter how much you think about it in advance, ditching, or putting a landplane down at sea, is always going to be somewhat of an unpredictable experience. A great deal depends on sea conditions; pilot preparation and skill are important; but luck is always a factor. Some pilots who fly often over water will only use low-wing aircraft, on the assumption that when ditched the wing will keep the cabin floating above water, for a time at least, in contrast to the high-wing plane which will not. On the other hand, if you flip over on your back—as you are more than likely to do with non-retractable gear—the flotation condition is reversed, in favor of the high-wing plane. A higher wing is less likely to catch a tip in a rough sea, but may give you more difficulty in a crosswind. Take your choice.

No one can eliminate the variables of ditching, but anyone can reduce their number. The chances are that you will land hard —so not using a shoulder restraint is asking for trouble. You had better also assume that you will land deep, possibly inverted, and that your exit time will be limited, so—*wear* not only your lifevest but all other survival equipment you may need. Flares, ELT, mirror, etc. should all be stowed in pockets of your flight suit. Your life raft should be secured within easy reach. Light planes usually float for from three to five minutes, time enough to get out but not for rummaging in the dark.

Many veteran pilots will run through a special in-cabin pre-flight before flying over water, checking on survival gear for everyone, and perhaps rehearsing such drills as locking a cabin door open before ditching so that it can not become jammed shut on impact with the water, or bracing the back against a support in order to kick out a window. You can never predict at what angle the ditched plane will come to rest, but you can be certain that you will want to go in one direction only—out.

During the tense moments of underwater evacuation, panic on the part of any one occupant could prevent all on board from escaping—imagine the consequences of one or more persons inflating lifevests before emerging from the airplane, or your trying to issue instructions upside down in the water. Hence the need for a calm, pointed briefing for all passengers before takeoff. Show and tell them what to do beforehand.

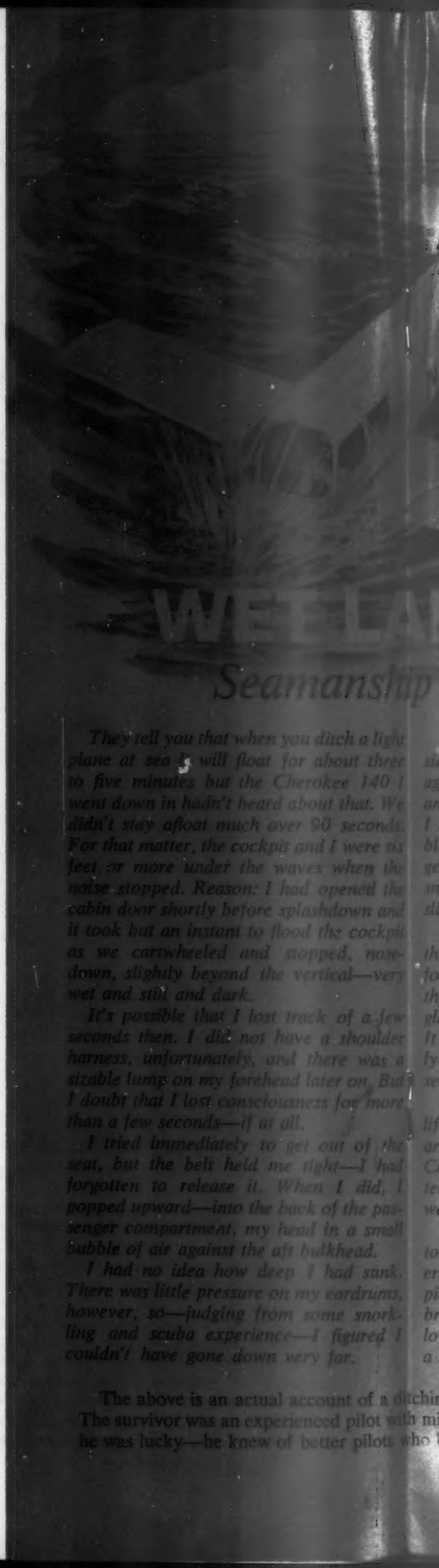
If you have to put down a landplane at sea, your best guide is a "sea analysis" if such is available from Coast Guard. If time or radio reception does not make this possible, you will have to fall back on what you know about the movement of water. You should have some basic understanding of the difference between *swells* and *waves*. To a landlubber the words may sound interchangeable, but they are not. To a seagoer, and to a pilot about to ditch, they signify two different kinds of information. Waves tell you about the *local wind conditions*—direction and velocity. Swells tell you about *the rise and fall of the sea surface*.

Waves and swells are both wind-originated, but swells are set in motion by winds of tremendous force (or by earthquakes) and the rolling movement continues long after the wind has veered off or died away—the swells keep on rolling until they beat themselves to death on some distant shore line. The distance between swell crests may be from 100 to 500 feet, and the swell height (from trough to crest) is usually not more than about 12 to 15 feet.

Waves are relatively small vertical movements of water whipped up by the *local, current* wind—the whiter the water, the stronger the wind. If you visualize a pond with a fresh wind blowing across it, the wavelets you see moving in a given direction are the handmark of the wind. If you then drop a large stone into the pond, you will set in motion ripples in all directions—some counter to the wind direction, some with it, some at an angle. This is a fair representation of a swell system, combined with waves. If you next drop a smaller stone into the pond, you will set up a secondary swell system, adding to the confusion and contradiction of surface movement.

A pilot wanting to ditch with the best possible consequences must be able to read the

At low altitudes the movement of swells can be masked by surface turbulence. A landing direction, usually parallel to the major swells, should be determined at the first sign of trouble.


Seamanship
They tell you that when you ditch a light plane at sea it will float for about three to five minutes but the Cherokee 140 I went down in hadn't heard about that. We didn't stay afloat much over 90 seconds. For that matter, the cockpit and I were six feet or more under the waves when the noise stopped. Reason: I had opened the cabin door shortly before splashdown and it took but an instant to flood the cockpit as we cartwheeled and stopped, nose-down, slightly beyond the vertical—very wet and still and dark.
It's possible that I lost track of a few seconds then. I did not have a shoulder harness, unfortunately, and there was a sizable lump on my forehead later on. But I doubt that I lost consciousness for more than a few seconds—if at all.
I tried immediately to get out of the seat, but the belt held me tight—I had forgotten to release it. When I did, I popped upward—into the back of the passenger compartment, my head in a small bubble of air against the aft bulkhead.
I had no idea how deep I had sunk. There was little pressure on my eardrums, however, so—judging from some snorkling and scuba experience—I figured I couldn't have gone down very far.
The above is an actual account of a ditchi
The survivor was an experienced pilot with mi
he was lucky—he knew of better pilots who

...NDING

...ship for Pilots

My back was jammed up against the left side of the fuselage, but my feet were against the right rear window. I kicked, and the plexiglass gave easily, (although I discovered later that several minor but bloody little cuts were caused by the jagged edges of the plexiglass. Worse, it snagged my jacket or life vest as I tried to slip out the window.

I pulled myself back into the cabin, then downwards and out the cabin door, forcing my eyes to remain open in spite of the biting salt water. As I went out I dimly glimpsed the outline of the right wingtip. It was battered and bent upwards, evidently by the force of contacting the rock-hard sea.

At the surface I inflated one side of my lifevest with CO_2 cartridge and twisted around just in time to see the tip of the Cherokee's empennage sink below the water. The sea was running eight to ten foot waves, and that's all there was in sight.

An hour and forty minutes later, thanks to an alert tower operator and a local fisherman, a beautiful U.S. Coast Guard cutter picked me up, very wet, somewhat cut and bruised, but not much worse for wear. But low in spirit—it was a poor way to start a weekend.

...of a ditching in the Pacific Ocean near Honolulu. ...ilot with military flight training, but he admits that ...pilots who had not made it.

sea and determine quickly the best landing direction. If a major swell system is present, you should be able to spot that first, at altitude; and next, the secondary swell, if present. You may be lucky enough to sight a flattened area on the water where opposing swells nullify each others movement. If the swells are of nearly equal strength, and running at an angle to one another, you must consider an approach that is as nearly parallel as possible to both. If not, plan a landing that avoids a direct confrontation with the face of a swell, for a tremendous force of energy is contained in that seemingly benign undulation.

Ideally, your best landing could be on the backside of a swell, just after it passes beneath you, but that calls for rather exceptional timing, and if you come down a little early you may not come up again. If you have a broad trough of several hundred yards between crests, your best bet is probably to land parallel to them and if possible on the backside of the crest, keeping your wings level with the sea rather than the horizon.

This is true even when it means bucking a fairly brisk crosswind. Your primary concern is your impact with the swell: a crosswind may upset you in the drink, but a swell hit broadside can turn your plane into instant scrap metal. If the wind is so strong that you cannot control the airplane except when headed into it, then of course you may have to accept a landing direction opposing the swell. Use full flaps and the slowest approach speed you can contrive.

Uppermost in your mind should be the thought that you want to keep the total momentum at impact as low as possible. If the swells are moving toward you, their momentum will be added to your own. The water may be moving slowly, but remember that momentum equals mass times velocity, and the mass of the sea is infinite. You have to disabuse yourself of the notion that water is a soft, crushable substance, like gelatin; it is not. You might do better to think of a swell as a moving wall of transparent bricks, and respect it accordingly.

If you are an experienced seagoer and have a Beaufort Scale placarded in your airplane or in your mind, you can read the wind velocity from the surface behavior of the sea with great accuracy—within a few knots—once you descend to an altitude of 2,000 feet or less. However, unless you have power remaining you may not have enough time for much study of the sea at this altitude. As a rule of thumb you can assume that if whitecaps are few or non-existent, the wind is relatively calm (less than 12 knots). If white caps are prominent, you have a fresh wind, possibly up to 25 or 30 knots. If there are long streaks of foam and abundant spray, look out—there are storm winds present.

Make sure that you are not fooled about the direction of the wind. Whitecaps fall forward with the wind but are overrun by the waves, producing the illusion that the foam is sliding backward. Observe this action in a non-emergency situation so that you can avoid puzzling over it at a critical moment; you can check your estimate of the wind against your drift, in relation to buoys or boats, or sea markers.

Ditching in a sea shell

To summarize briefly, once you are committed to a sea landing you should:

1. Look for swell systems from altitude.
2. Look for white water as you near the surface. If there is none or very little, ignore the wind and land as nearly parallel to the swells as possible.
3. If there are whitecaps, note wind direction and land as above.
4. If there are prominent foam streaks, land into the wind. Try to avoid the face of a swell.

If you happen to live near a Coast Guard air station, the safety officer may have an opportunity to give you a comprehensive briefing on ditching and sea conditions you are likely to encounter. Keeping pilots out of the water is one of the Guard's main interests.

Left: A smoke bomb can cut minutes, perhaps even hours, from time of ditching to rescue. Right: The Coast Guard, well trained and equipped for a rescue at sea, lowers a special floatable basket from a helicopter to downed aircrew. Raft greatly improves survival chances.

Famous
FLYERS

In 1843 Cayley envisioned a vertical takeoff and landing aircraft with two pairs of whirling "elevating fliers" (contra-rotating to eliminate torque) and a movable horizontal tail and rudder.

Sir George Cayley
and his Flying Coachman

In 1912, Orville Wright proclaimed his debt of gratitude to an English member of the landed gentry who had written about the possibilities of heavier-than-air flight a hundred years before that historic flight at Kitty Hawk. Wright said: "Sir George Cayley knew more of the principles of aeronautics than any of his predecessors, and as much as any that followed him up to the end of the nineteenth century. His published work is remarkably free from error and was a most important contribution to the science."

The Wrights used what Wilbur said were "the very ingenious calculations of Sir George Cayley" in their own preparations for powered flight, and there is ample evidence in the correspondence between the Wrights and Octabe Chanute as to just how important and valuable these calculations were to them.

The astonishing fact is that Cayley, working with the meager knowledge available at that time and his own brilliant mind, was able to design an aircraft which, except for an engine, was as modern in conception as the Wright's plane a hundred years later. And near the end of his life he designed and directed two different manned glider flights, which are believed to be the first recorded manned glider flights in history. Rightfully, many historians call him the Father of Aerodynamics.

Cayley was born at Scarborough, England, on December 27, 1773. He was educated at schools in York and Nottingham, but the inquisitive and inventive young man received most of his scientific training from private tutors his father had arranged for him. One of these was the celebrated mathematician, George Walker, whose daughter, Sarah, he was later to marry. (The marriage lasted until his death 63 years later.) For most of his life he continued to manage conscientiously the large family estate he had inherited at his father's death, in 1792.

Cayley's active mind had early become intrigued with the possibilities of man's conquest of the skies. In 1783, the Frenchman Pilatre de Rozier had made the first manned balloon flight, and Cayley began to reason that flight in a heavier-than-air craft was also now possible. In 1792, he began a series of experiments with a toy helicopter, the so-called "Chinese flying top", built by the Frenchmen, Launoz and Bienvenu. By 1804 he wrote his first extended essay on the principles of manned flight, and in 1809 he published in *Nicholson's Journal of Natural Philosophy* his extraordinary treatise "On Aerial Navigation", an article widely reprinted throughout the western world for the remainder of the century.

Cayley was convinced that the old idea of ornithopter flight—that is, flight which tried to use moving wings in imitation of birds—should be discarded, and he argued for a plane constructed with fixed wings. In his articles and in the drawings contained in his notebooks he made a remarkable outline for the design of the modern plane. In his 1809 article, which supplied the theoretical basis of aerodynamics, he talked about fixed wings, control surfaces on the tail, fuselage, and a combined elevator and rudder. He understood the purpose of the wings, and said that to get proper stability they should be set at a slight angle—the dihedral of a modern airplane. And to keep them headed properly into the wind, he said they needed vertical and horizontal rudders—which is a reasonable description of a modern plane's tail assembly.

He also discussed the relation of velocity to lift, wing loading, stress, weight saving, and the principle of an internal combustion engine. And he argued for streamlining in the design of aircraft, stating that every pound of direct resistance which could be avoided would support 30 pounds of additional weight without the necessity of additional power.

He had tested these principles with unmanned gliders that he constructed and flew near his home at Brompton. He wrote: "All these principles upon which the support, steadiness, elevation, depression and steerage of vessels for aerial navigation depend, have been abundantly verified by experiments upon a large and small scale. I made a machine having a surface of 300 sq. feet, and it would sail downwards in any direction according to the set of the rudder. When any person ran forward with it with his full speed, taking advantage of a gentle

breeze in front, it would bear upward so strongly as scarcely to allow him to touch the ground, and would frequently lift him up and convey him several yards."

Power, of course, was his insoluble problem for sustained flight. He was convinced that his plane would fly if only he could find a proper engine. "The best mode of producing the propelling power," he wrote, "is the only thing that remains yet untried toward the completion of the invention. I feel perfectly confident that this noble art will soon be brought home to man's general convenience and that we shall be able to transport ourselves and families and their goods and chattels more securely by air than by water, and with a velocity of from 20 to 100 miles per hour. To produce this effect it is only necessary to have a first mover which will generate more power at a given time in proportion to its weight than the animal system of muscles."

However, at the time Cayley wrote those prophetic words about the future of aviation the only "first movers" available were cumbersome and heavy steam engines. He saw little possibility of ever making a steam engine light enough for use in an aircraft, and for the rest of his life he experimented unsuccessfully in an attempt to develop a light and powerful engine which would operate by expanding air.

In addition to the actual scientific work he did toward the development of the airplane, Cayley made another important contribution to aviation: as a distinguished British scientist he lent respectability to the quest for heavier-than-air flight. There were many people in that epoch who felt that the whole topic was a mad dream, citing the old cliche that if God wanted man to fly He would have created him with wings.

Cayley was aware of the misgivings around him, and at one point he referred to ". . . the art of flying, or aerial navigation as I have chosen to term it, for the sake of giving a little more dignity to a subject bordering upon the ludicrous in public estimation." Even Cayley's own son felt there was something eccentric about the matter, and after his father's death he attempted to hide Cayley's private notes and papers from public inspection.

Versatile Inventor

Aerial navigation was only one of Cayley's interests. He designed artillery shells for use by the British navy during the Napoleonic wars. In 1807 he invented and patented a calorific (hot air) engine which was used extensively in industry throughout the 19th Century. In 1825, he designed a caterpillar tractor, the first forerunner of the tracked vehicles of today. He invented the tension spoke wheel, the principle of which is still used in bicycles, and he employed this wheel on his later gliders. Furthermore, he invented an automatic railroad brake; he made valuable contributions in acoustics, optics, electricity, and land drainage; and he even invented an artificial hand for use by amputees.

In the 1830's he became actively engaged in British politics, and he gave lectures calling for Parliamentary reform. For three years he served in Parliament himself as the Whig member for the Borough of Scarborough, but he found the political life in London distasteful, and he retired to his estate at Brompton to resume work on his inventions.

In 1837, he published another paper on aerial navigation in *Mechanics' Magazine* which restated his earlier ideas and urged further experimentation. By 1848, when he was 75 years old, and no significant advance had been made in developing a light weight engine, he felt that the most promising area of experimentation for the immediate future was with unpowered manned flight, or gliders. He reasoned that the manned gliders would at least enable him to demonstrate the validity of his theories in aerodynamics.

In 1849, he constructed a fixed triplane wing glider in which the pilot sat in a carriage of the glider, and he wrote in his notes: "A boy of about ten years of age was floated off the ground for several yards on descending a hill, and also for about the same space by some person pulling the apparatus against a very slight breeze by rope."

We have no record of who the ten-year-old boy was, but the flight in 1849 was undoubtedly the first recorded manned glider flight in history.

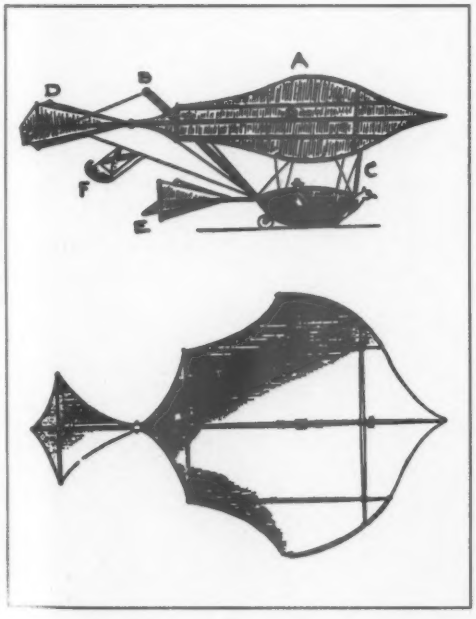
Cayley continued to publish his papers about his experiments in aviation, and in 1853 he sent a description of an unpiloted glider flight which he called the "improved 1853 rudder glider" to a French aeronautical society. Interestingly, in 1971 a British glider expert, Commander J. S. Sproule, constructed a duplicate of this original glider from Cayley's notes, and sailed it gracefully over the fields near Brompton, thus verifying the validity of Cayley's work and theories of 118 years previously.

Cayley's last major contribution to aeronautics occured in 1853. He built another glider, slightly heavier than the one of 1849 and with a more sophisticated system of brake levers, and he put his coachman in the seat of the carriage for another manned flight. Cayley's notes are unclear on the actual distance of the flight—his great-granddaughter, who was a witness to the flight said it went "about 500 yards," but that seems to be an exaggeration. We do have a quote from the unnamed and apparently reluctant coachman immediately after the flight: "Please, Sir George, I wish to give notice. I was hired to drive, and not to fly."

Cayley's mind remained alert and active until his death in 1858 at the age of 84. To the very end he was still tinkering in his shop, attempting to devise some type of light-weight engine. He failed in that, but he nevertheless made immensely important contributions toward man's search for heavier-than-air flight. Early in the century Cayley had written on the inner cover of his notebook.

"You, to whom it may concern when I am gone, may find the seeds of thought in these scrawls."

Those seeds of thought gave birth to a new age. ■



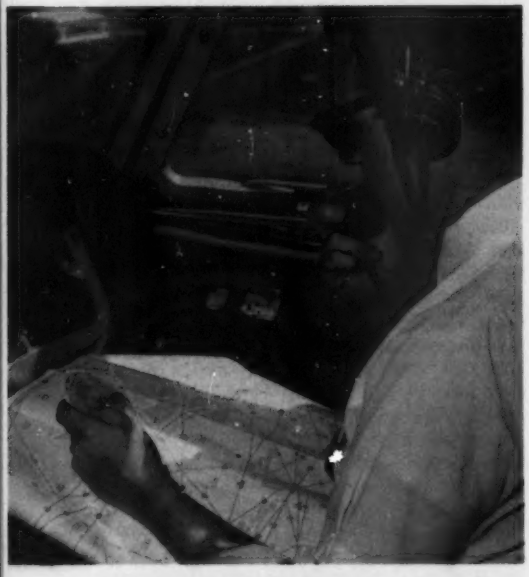
Although Cayley drew up the plans for his "governable parachute" in 1852, it was not recognized as a heavier-than-air manned aeroplane until a century later. Large tail-unit served as stabilizer, smaller one as rudder/elevator.

Sir George Cayley, aged 70.

Cleared to Go V

This fifth and final article in our series on air traffic clearances deals with acceptable IFR transition routes.

The Straightest Distance Between Two Points . . . IFR



From Washington National clearance delivery: "CESSNA TWO ZERO XRAY, CLEARED TO MONTPELIER INTERSECTION VIA VICTOR THREE, MAINTAIN FOUR THOUSAND, MAINTAIN RUNWAY HEADING FOR VECTORS TO VICTOR THREE . . ."

Transponder code and departure frequency were added. When the pilot finished writing he glanced at his chart with a frown. "That's nothing like the route I filed for," he complained into the microphone. "I requested Victor 157—a straight shot to Richmond. I don't even see this Montpelier."

The controller was polite. "That is the clearance ATC has for you, sir."

The pilot unfolded the en route chart in the cramped quarters of the cockpit, muttering, "It's getting to be more trouble than it's worth to file instruments. Sure isn't like the good old days. Why don't I ever get the route I file for?"

The answer is simple. Many pilots who are competent in instrument flying are not in the habit of learning about the gateways, or "transition points," that lead into and out of terminal areas. They know all about preferred routes, so they have no trouble with the en route portion of long flights, but they are unware of—or do not bother to check into—the local bulletins showing the manner in which air traffic on instrument flight plans normally moves in a given locality.

Between Richmond, Va., and Washington, D.C., for example, Victor 157 is the shortest IFR route—virtually a straight line. But the Washington Center uses Victor 157 exclusively as a one-way route for northbound traffic, and if you are southbound you will have to execute the dogleg involving Brooke VOR, Victor 3, the Montpelier intersection, and possibly radial 332 into Richmond. The additional mileage will only take a few minutes of flying time, but the time lost while re-setting your navigation radios, locating an unfamiliar fix and re-drawing your route on the chart could lead to a delayed departure.

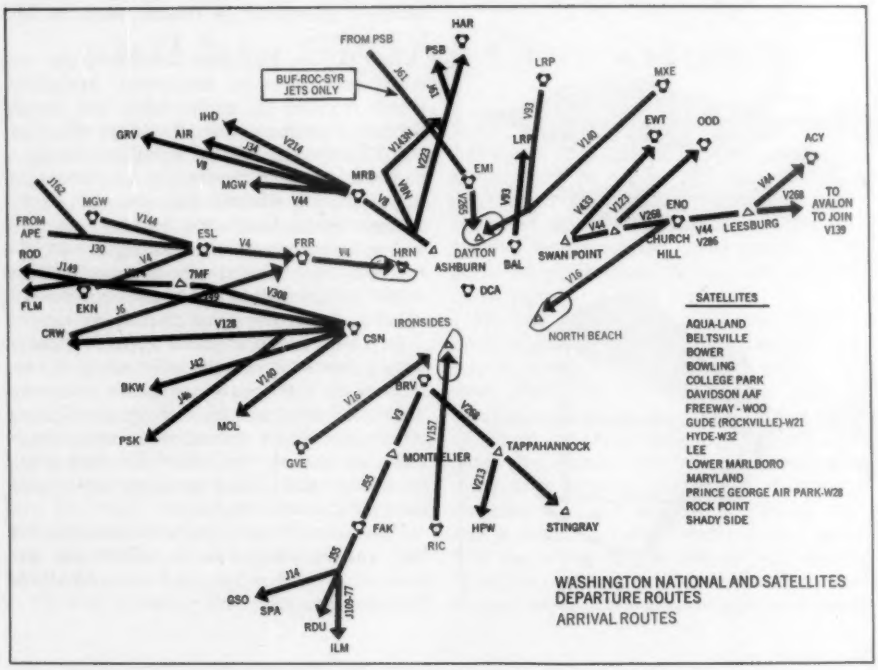
When you look at an instrument chart for the nation's capital, you see what appears to be a great multiplicity of choices for departing or approaching the airport. But if you look at the suggested routings in the current bulletins for this area issued by the Washington Air Route Traffic Control Center, you will see that there are just four transition points for arrival and five (different points) for departure. Unless you utilize one of these transition points in your instrument flight plan, you cannot expect to have it cleared as filed.

The Washington center's bulletin covers 12 major airports in Maryland and Virginia, plus their satellite airports, and also shows en route traffic flow and jet routings. Most of the other 20 centers in the adjacent 48 states have similar bulletins. Many control towers and flight service stations also have printed aids to pilots for IFR flight planning. Your local FSS or GADO can usually help you obtain bulletins that are of interest to you, and these shorten the total operational time of your IFR flight appreciably.

Another means of minimizing the chances of delays on instrument operations at busy terminals is pilot familiarity with SIDs (standard instrument departures) and STARs (standard terminal arrival routes). These are pre-planned routings, identified by a code name which greatly reduces the wordage involved in a clearance. For example, without a SID, an IFR departure clearance in the San Francisco Bay area might read.

". . . AFTER TAKEOFF CLIMB VIA OAKLAND TWO EIGHT EIGHT RADIAL TO THREE THOUSAND, CROSS OAKLAND TWO EIGHT EIGHT FOUR MILE DME FIX AT OR BELOW THREE THOUSAND, TURN RIGHT HEADING ZERO SIX ZERO, INTERCEPT AND PROCEED VIA THE OAKLAND ZERO TWO TWO RADIAL TO COLLEGE INTERSECTION, CROSS COLLEGE AT OR ABOVE FIVE THOUSAND, THENCE VIA THE OAKLAND ZERO TWO TWO RADIAL AND SACRAMENTO ONE NINER FIVE RADIAL TO SACRAMENTO . . ."

Coming and going—the pattern used by Washington Center for instrument traffic shows four entry points and five exit points for the Capitol area. Using one of these transition points, an IFR pilot has a good chance of getting his flight approved as filed.



Using a SID, the same departure clearance would read simply: ". . . COLLEGE TWO DEPARTURE, SACRAMENTO TRANSITION . . ."

SIDs are issued by the Air Traffic controllers whenever appropriate, unless the filed flight plan specifies "no SIDs/STARs." In order to accept SIDs or STARs a pilot should have the pertinent text and/or charts on hand. SIDs are published in three volumes by the Department of Commerce and a STAR book is now available. Both SIDs and STARs are issued privately by Jeppesen.

The Airman's Information Manual, Part 3, contains the location of STARs and SIDs. Both STARs and SIDs may be included in your flight plan.

Incidentally, SIDs and STARs are a pretty fair substitute for local ATC bulletins, when these are not available, as a means of locating an acceptable IFR transition point at a terminal.

Being able to use these pre-planned routings will save both you and the controller valuable time in IFR flight planning. You will have less wordage to write down, and less to copy. Incidentally, you should always take the time to copy down *fully* any changes in the clearance given you. You may feel certain you can remember a simple detail, such as a 20 degree heading at 3,000 feet, but if in the press of handling the aircraft in poor weather and busy traffic you "misremember" it as a 30 degree heading at 2,000 feet, the results could be disastrous.

Never, for whatever reason, accept a clearance you do not fully understand, assuming that you will be able to figure it out when the time comes—that is asking for trouble. Instrument flying is safest and most enjoyable—and least plagued with problems on delays—when the pilot does all of his homework on the ground.

Standard Instrument Departure (SID) charts are published in three bound books, 5½" x 8½". There are separate volumes for states east of the Mississippi River, states west of the Mississippi, and for Alaska. Regular prices for a one-year subscription, revised every eight weeks, are as follows (airmail prices in parenthese):

Eastern U.S.	$ 4.30	(5.30)
Western U.S.	7.10	(8.75)
Combined East and West U.S.	11.00	(12.50)
Alaska	6.65	(7.00)

A single bound volume includes all Standard Terminal Arrival Route (STAR) charts for the U.S. Prices are:

STARs	$5.00	(7.75)

Order from National Ocean Survey, Distribution Division, C44, Washington, D.C. 20235.

Pilot BRIEFS

■ TO THE RESCUE. Guidelines for water/foam type fire and rescue trucks have been published to assist airport management in local procurement specifications. The guide is designed for general use, and is not regulatory. It incorporates material from three earlier advisory circulars, which are now cancelled: 150/5220-2; 150/5220-3; 150/5220-5; 150/5220-7. The new circular, "Guide Specification for Water/Foam Type Aircraft Fire and Rescue Trucks" is designated as AC 150/5220-10.

■ AIRCRAFT ENGINE CERTIFICATION. An FAA handbook recently revised contains information for certificating engines in a way which is acceptable (although not the only means) for compliance with the Federal Aviation Regulations. "Aircraft Engine Type Certification Handbook", AC 33-2A, completely replaces AC 33-2 and AC 33-2 CH 1, which are now cancelled.

■ AN UPDATED DIRECTORY of all FAA-certificated aviation maintenance/technician schools is now available (AC 147-2K). Certification of a school by FAA indicates that it meets the requirements of FAR Part 147 for the ratings issued, and does not necessarily indicate that the school has been approved for educational purposes by other Federal or State agencies. This and other information about a specific school can be obtained by contacting the school directly at the address listed in the free directory.

■ LOST AND FOUND. Some 200 pilots who managed to get lost in flight during the month of August were located and led to safety by the Air Traffic Service. There were a total of 317 flight assists reported during the month, with navigation problems predominating. Other major problems were related to weather, insufficient fuel, and equipment failure.

■ CHOPPER PILOTS working toward an Airline Transport Pilot certificate will be interested in the revised Written Test Guide for the ATP (Helicopter) rating. The guide describes the type and scope of required aeronautical knowledge covered in the written tests, lists available reference materials, and presents sample test items with answers and explanations. The booklet, Advisory Circular AC 61-42A (Stock No. 5011-0057), is for sale by the Superintendent of Documents, GPO, Washington, D.C. 20402, or at retail Government Printing Office bookstores for 40 cents.

■ Unless otherwise indicated Advisory Circulars mentioned in this column are available free from DOT/FAA, TAD 484.3, Washington, D.C. 20591.

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U. S. ARMY AVIATION SCHOOL LIBRARY
FORT RUCKER, ALABAMA

Model Aircraft Operators Cautioned on Flight Hazards

Operators of radio-controlled and free-flight model aircraft are encouraged in a new FAA advisory circular to comply with specified guidelines in the interest of maintaining good community relationships and avoiding potential hazards to full-scale aircraft.

Modelers are asked to select an operating site sufficiently distant from populated areas to avoid creating noise problems or danger to those on the ground and to keep aircraft within 400 feet of the surface and no closer to an airport than three miles, except by permission from the control tower, if there is one, or the airport manager at other airports.

Copies of the advisory circular AC 91-34, are available free from DOT/FAA., TAD 484.3, Washington, D.C. 20591.

Terminal Control Area Proposed for Boston Airport

A new terminal control area (TCA) has been proposed by FAA for Boston's Logan International Airport as part of a long-range program to reduce the potential for midair collisions near congested airports. According to FAA Administrator John H. Shaffer, "Our experience with the TCA concept at five other locations shows that it both enhances safety and permits more efficient use of available airspace."

TCAs are presently in effect at Atlanta, Chicago's O'Hare, Washington National, Los Angeles, and in the New York area. FAA is currently evaluating public comments on a TCA proposed for the San Francisco Airport before taking final action there. An air traffic control clearance is required to fly in a TCA and the pilot must have at least a private pilot certificate, plus an aircraft with two-way radio with appropriate frequencies, VOR or TACAN receiver, and transponder.

Proposed configuration of the Boston TCA incorporates experience from earlier TCAs, and suggestions from users. Under the proposal the Boston TCA would be circular with a 20-mile radius and a ceiling of 7,000 feet MSL. Floor elevation would range from ground level, in the center, stepping up in rings to 3,000 ft. at the outer edge, except for one area where the floor has been raised to 4,000 ft. to accommodate a number of general aviation airports to the west.

Comments on the proposed Boston TCA, Docket #72-WA-12, should be submitted by October 30, 1972, to FAA, NE-500, 154 Middlesex St., Burlington, Mass. 01803.

SST Follow-on Research Published

The first 24 of a series of supersonic transport follow-on technology reports from FAA are now available through the Defense Documentation Center (DDC). Subjects include noise reduction, supersonic flight controls, fuel tank sealants, and titanium structures. Later reports will deal with electronic displays, power systems, and flutter.

All present and future reports will be available to Government agencies and contractors who are registered users of the DDC. Address: DDC, Cameron Station, Alexandria, Va. 22314.

Airworthiness Directives Updated

A new Summary of Airworthiness Directives has been published by FAA to include all ADs issued prior to January 1, 1972. These directives, concerning safety or inspection items of sufficient urgency to warrant prompt attention, are of importance to aircraft operators and mechanics.

The two volumes of the Summary are available from the Superintendent of Documents, GPO, Washington, D.C. 20402, and are priced as follows, including biweekly supplemental service: Volume I (small aircraft) Catalog #TD 4.10/2:972, $5.50; Volume II (large aircraft) Catalog #TD 4.10/2:972, $6.25; an additional 25% is required for foreign mailing.

Those persons now receiving biweekly listings must purchase a new summary dated January 1972 in order to continue receiving the supplements. Aircraft owners will continue to receive ADs for their particular plane.

New Localizer Antenna Tested

Less interference from outside factors is one of the benefits pilots can expect from a new "large aperture traveling wave" localizer antenna array now being tested by FAA at Boeing Field.

The Seattle, Wash., airport was chosen for the test because of inherent siting problems such as reflections from huge hangars, power lines and fences, which often distort ILS signals. The new antenna may provide Category II capability at some locations where it has been impossible with older types.

FLYING MATTRESS? Certificated experimentally as the Irish Flyer, this modern day version of the Magic Carpet combines an air-inflated parafoil with a gyrocopter-like airframe and a propeller driven by a snowmobile engine. Dr. John D. Nicolaides of South Bend, Ind., who evolved the parafoil-plane from a kite, hopes it will become the long awaited "flivver" of the aviation age, as well as a vehicle for returning space travelers to earth gently.

• Two-wheel Landings

After 60 hours in a Cessna 170 I am starting to feel comfortable, but crosswind landings really rattle my cage. I do them in the three-point attitude but I keep reading articles saying that you *must* learn wheel landings. I question this logic, and wonder what you have learned in regard to taildraggers in crosswinds.

Ernest H. Campbell
Pleasant Hill, Calif.

In a discussion of crosswind landings in FAA's Flight Training Handbook (AC 61-21) mention is made of landing on one wheel in crosswinds, but this is not intended to indicate that wheel landings are necessary. The intent is to point out that, with a wing low to eliminate drift, a landing on one main *wheel is not unusual in any airplane.*

The wheel landing is used to cope with strong, turbulent, or gusty *wind conditions, because with a power approach it ensures greater effectiveness of controls throughout the approach and touchdown. Many experienced "taildragger" pilots, however, prefer to touch down, at stall, in a "three-point" attitude (on the tail wheel and upwind main wheel) regardless of wind angle. Touchdown speed is slower, which saves wear and tear on tires.*

In an extremely strong, gusty or turbulent crosswind condition, the really wise course is to find another airport with conditions more suitable to your experience and airplane.

• Approach Charts

I subscribe to the full set of U.S. approach charts. I find it very difficult to keep my filing up to date and feel that I am drowning in paper. I would like to know why we seem to be flooded with miniscule changes, and why so many charts must be re-issued in one to three months. An important change could be easily obscured by a flood of unimportant changes which are not important to safety—these could be accumulated until a revision is really necessary. Another alternative would be to follow the military plan and publish bound copies, which would completely replace the prior editions.

H. P. Lindsley
Wichita, Kansas

Recent surveys indicate that user opinion is divided about 50-50 on the subject of loose-leaf approach charts versus bound volumes. National Ocean Survey is presently investigating means of producing an economically feasible bound version.

As for revisions, our policy is to issue urgent changes at once and to allow others to accumulate, but we do all we can to avoid overburdening pilots with paperwork without jeopardizing safety, and we are always open to helpful suggestions. The fact that there are frequent physical changes taking place around airports (new buildings, towers, runway relocation, etc.) is something we must constantly monitor and adjust to, for the safety of reliable instrument flying.

• Transponder Squawk

Obviously some transponders have been found to function suboptimally. I believe we pilots should be made aware of brand deficiencies by FAA promptly.

R. Nelson
Williamsburg, Mass.

Until recently standards were established only for airline-type transponders. Standards have now been developed for general aviation transponders and we are in the process of revising the Technical Standards Order (TSO-C74) to include these. At the same time we will establish a specific date when all transponders in use must meet FAA requirements. After that time transponders having deficiencies will have to be withdrawn from service. The end result will be a "clean" transponder environment, which is what is really needed for aviation safety.

• Torquing About the Nose

You stated in the July issue ("Winds Across the Runway") that everyone knows that in this country torque has a tendency to turn the nose of the airplane to the left. In other countries or in the southern hemisphere does it have a tendency to turn it to the right?

Santa Monica, Calif.

In British, Russian and some American homebuilt aircraft the prop turns to the left counter-clockwise, from the pilot's point of view. This would produce a torque effect pushing the aircraft nose to the right.

• Jane's Aircraft

In the Flight Forum of June 1972 you mention a directory called "Jane's All the World's Aircraft". Where can I purchase this book?

C. M. Lauridsen
Long Beach, Calif.

These books are published annually in London, and early issues date back to 1909. They can be bought in this country from McGraw Hill Book Company, 330 W. 42nd St. New York, N.Y.

• Plane Figures

Our entire student body and staff enjoy your magazine each month, especially the articles on aviation history. Do you have any plans to compile these in book form? I would also like to know how many airplanes have been built in the U.S.A. (civil and military) since the first Wright Flyer. My guess is 500,000.

Jesse B. Fox
University of Illinois
at Urbana

We have a tentative plan to collect the historical articles in booklet form. Our readers will be advised of publication.

Your aircraft guess is conservative. The Aerospace Facts and Figures handbook of Aerospace Industries Association of America, Inc. shows that from 1909 through 1970 there were about 709,000 aircraft produced, including both military and civil.

FAA Aviation News welcomes comments from the aviation community. We will reserve this page for an exchange of views. No anonymous letters will be used, but names will be withheld on request.

• VFR for Air Carriers?

I recently received FAA Advisory Circular 90-59 on the Arrival and Departure of High Performance Aircraft ("Keep-em-high" program) which states in part: "When pilots of these (high performance) aircraft are flying VFR they are encouraged to abide by the keep-'em-high philosophy, i.e. remain as high as possible as long as possible".

I assume that most of this type of traffic would be jet air carriers. I've always had the impression that airliners could not fly on a VFR flight plan when carrying passengers or cargo. If this is true, under what conditions would these planes be flying VFR? Where do I fiind this in the FAR's?

John S. Ruggieri
Virginia Beach, Va.

Air carriers are required to fly on an instrument flight plan; however, in VFR conditions pilots are permitted to cancel the IFR flight plan when they have the airport in sight, and then execute the landing visually. While not spelled out in the Federal Aviation Regulations, these requirements are part of the Operating Specifications *for airlines referred to in FAR 121.25(b).*

• Guarded by the Guard

In your article on ditching at sea in the August issue of FAA AVIATION NEWS you speak of Coast Guard aid. Does the Coast Guard guard the emergency frequency 121.5 continually? Would this be the frequency to use to call the Coast Guard to summon aid for a vessel in distress that a pilot observes from the air?

H. Jonas, Jr.
New York, N.Y.

The Coast Guard does not monitor 121.5 on a regular basis. To contact them from the air you would need to know the frequencies in use at a given locality. Best course of action for a pilot who observes an emergency at sea is to use the quickest air traffic control frequency (flight service station, center, approach control, etc.) They will promptly relay the message to the proper station.

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